

REMARKS

This Response is submitted in reply to Office Action dated April 21, 2008, in which the Examiner:

rejected claims 1-5 under 35 USC § 103(a) as being unpatentable over US Patent No. 6,352,662 to Murphy et al. (Murphy) in view of US Patent No. 3,893,318 to King, Jr. and in further view of US Patent No. 6,299,810 to Blackinton, Jr. et al. (Blackinton).

The rejection is respectfully traversed as follows. Applicants have newly proposed claims 17-21. Claims 1-5 and 17-21 are pending, of which Claims 1 and 17 are the only independent claims. Claims 6-16 have been previously withdrawn.

To establish a *prima facie* case of obviousness for a claimed invention, all the claim limitations must be taught or suggested by the prior art. M.P.E.P. § 2143.03. Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness because the combination of Murphy, King and Blackinton do not teach or suggest each recitation of independent claim 1.

In particular, the combination of Murphy, King and Blackinton do not teach or suggest a method including inserting a composite body including an internal-pressure holding tube and a prepreg *into a vacuum chamber containing a forming die and evacuating the vacuum chamber in an isolation state where the composite body and the forming die do not contact each other*, as recited in independent claim 1. The Examiner characterizes Murphy as teaching, *inter alia*, "...placing said wrapped assembly in a mold (forming die) without **substantial** contact with the forming die (space between items 60 and 70, also see "against" at 5:48). (Emphasis added). Applicants respectfully submit that independent claim 1 of the present application does not recite the placing of a wrapped assembly in a forming die without *substantial* contact with the forming die. In stark contrast, independent claim 1 of the present invention recites, *inter alia*, "...evacuating said vacuum chamber in an isolation state where said composite body and said

forming die do not contact each other.” That is, claim 1 of the present invention requires that there is no contact between the composite body and the forming die. Applicants respectfully submit that there is a distinct difference between not “substantially contacting,” which necessarily implies that there is *some* contact, and “do not contact,” which clearly and explicitly indicates that there is *no* contact.

Furthermore, and more specifically, Murphy discloses wrapping a mandrel with a bladder and a plurality of pre-preg plies, placing the wrapped assembly within, *and into contact with*, a mold and pressing the pre-preg plies outward against the mold by introducing a pressurized gas through the mandrel. (Murphy, col. 3, ll. 5-25; col. 5, ll. 32-35; FIG. 3). Compare the left end of the pre-preg and lock support in Murphy (FIG. 3) with the cantilevered support of the left end of the pre-preg in Applicant’s FIG. 3. “The mold generally will include a cavity having a predefined shape for the shaft and grip region...” (Murphy, col. 3, ll. 8-11). In contrast to Examiner’s allegation, Murphy does disclose in FIG. 3 that the pre-preg plies contact the mold when the wrapped assembly is placed inside the mold. Most importantly, Murphy does not support the pre-preg out of contact with the mold during evacuation to allow removal of air bubbles from the pre-preg. Contrast the lack of mandrel support in Murphy FIG. 3 with Applicant’s FIG. 3.

Applicants respectfully submit that neither Murphy, nor any of the other cited prior art, either alone or in combination, teaches this recitation of independent claim 1 of the present invention wherein there is no contact between the composite body and the forming die. Accordingly, as a *prima facie* case for obvious has not been established, Applicants respectfully request that the instant rejection be withdrawn and that the case now be passed to issue.

Notwithstanding the above, the Examiner asserts that Murphy teaches all the elements of claim 1, with the exception of (1) a vacuum chamber containing the forming die, and (2) evacuating the forming chamber in an isolation state where the composite and the forming die do not contact each other. To teach

these elements, the Examiner relies on King, Jr. The Examiner alleges that King teaches “a vacuum chamber containing a forming die” and “evacuating the forming chamber in an isolation state where the composite and the forming die do not contact each other (chamber is under vacuum).”

Applicants respectfully submit that the Examiner has incorrectly interpreted the meaning of “isolation state” as it is used in the present application. “Isolation state” is described in Para. 54 of the present application as the space between the composite body and an inner surface of the lower die, factoring in the deformation of the prepreg. In particular, in such “isolation state,” “...the composite body 10 (the prepreg 13) is positioned immediately above the shaping recess 32*b* of the lower die 32 without contacting an inner surface of the lower die 30*b* in the shaping recess 32*b*.” Para. 54 further provides, “[t]he amount of isolation of the composite body 10 from an inner surface of the shaping recess 32*b* of the lower die 30*b* is determined so that the composite body 10 *does not come into contact* with the inner surface of the shaping recess 32*b* in an evacuation operation using the evacuation system...” (emphasis added). Applicants respectfully submit that a close reading of the present application and independent claim 1 will reveal a clear definition of “isolation state.”

However, it appears that the Examiner interprets “isolation state” to mean that the forging chamber is located in one vacuum chamber, and the alloy ingot is located in a separate vacuum chamber (while heating up), the chambers being under vacuum. Applicants respectfully submit that such an interpretation is incorrect in light of Para. 54 of the present application and independent claim 1. The proper question then becomes whether King discloses evacuating a vacuum chamber in an isolation state where the composite body and the forming die do not contact each other. A close reading of King reveals that King does not disclose such an isolation state. To the contrary, King is solely concerned with the moving of workpieces within a vacuum chamber from a loading chamber to a preheat chamber and to the forging press. There is no such disclosure in King of evacuating a vacuum chamber where the composite body and the forming die do not contact each other. As with Blackinton, the workpiece in King is supported

from underneath during the vacuum cycle and therefore is not in an “isolation state” as defined in the present application.

In addition to the above, claim 1 recites a vacuum chamber *containing a forming die*, and evacuating said vacuum chamber (containing a forming die) *in an isolation state*. Applicants respectfully submit that in King, the vacuum chamber and the forming chamber are not the same chamber, and therefore the evacuation of a vacuum chamber containing a forming die, the composite body and the forming die being in an isolation state (no contact between them), is not possible with the apparatus of King.

Accordingly, as neither King nor any of the other cited prior art, either alone in combination, teach or suggest each and every element of independent claim 1, a *prima facie* case for obviousness has not been made. In particular, there is no teaching of evacuating a vacuum chamber where the composite body and forming die do not contact each other. Applicants therefore respectfully submit that independent claim 1 is allowable, and request that the instant rejection be withdrawn.

Applicants respectfully submit that the Examiner has not established the *prima facie* case of obviousness because one of ordinary skill would not have combined Murphy with King and further with Blackinton to teach or suggest each recitation of Claim 1. The apparatus of King has been classified by the USPTO as belonging to the Metal Deforming group. The present patent application is classified as belonging to the Plastic and Non-Metallic Article Shaping group. While the present invention solves the problem of eliminating the trapping of air bubbles between the composite weave and the forming die, the apparatus of King is concerned solely with the preventing of metal alloy oxidation corrosion on completely different materials from that of the present invention. Applicants respectfully submit that one skilled in the art of nonmetallic article shaping would not look to the metal deforming arts to solve the problem of air bubbles being trapped between the composite weave and the

forming die. Accordingly, such a combination of Murphy, Blackinton and King would not have been obvious at the time of the invention.

As one of ordinary skill would not have combined Murphy with King and further with Blackinton, and as these references do not teach or suggest each and every element of independent claim 1, Applicants respectfully request the allowance of claim 1 for at least the reasons stated above. Furthermore, claims 2-5 depend from Claim 1 and include additional recitations. Applicants respectfully request allowance of claims 2-5 for at least the reasons states in connection with Claim 1.

Notwithstanding the above arguments, Applicants have newly proposed claims 17-21, of which 17 is an independent claim, to further define the invention over the prior art. In particular, claim 17 recites, *inter alia*:

...evacuating said vacuum chamber in an isolation state where said composite body and said forming die do not contact each other, *so that air having existed in a space between an outer periphery of said composite body and a periphery of said forming die is removed*; and clamping said forming die to bring said forming die and said composite body into contact with each other and heating said forming die with an application of pressure to an inside of said internal-pressure holding tube after completion of said evacuating step, *while maintaining said evacuation state, where air having existed in a space between said outer periphery of said composite body and said periphery of said forming die has been removed*.

Applicants respectfully submit that neither Murphy, King nor Blackinton, nor any of the other cited prior art, either alone or in combination, teaches or suggests the clamping step of claim 17 wherein *the evacuation state is maintained and where air having existed in a space between the outer periphery of the composite body and the periphery of the forming die has been removed*. Accordingly, Applicants respectfully submit that claim 17, and claims 18-21 which depend therefrom, are

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allowable for at least this reason and the reasons mentioned above with respect to claims 1-5.

Please charge Deposit Account No. 13-0235 in the amount of \$460 for a two-month extension of time and \$50 for one claim in excess of 20 for a total of \$510.00. If additional fees are required, the Commissioner is authorized to charge such fees or credit any overpayment to said account.

Respectfully submitted,

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